DECISION DOCUMENT

272 4th Avenue
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224298
July 2022

Prepared by
Division of Environmental Remediation
New York State Department of Environmental Conservation

DECLARATION STATEMENT - DECISION DOCUMENT

272 4th Avenue
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224298
July 2022

Statement of Purpose and Basis

This document presents the remedy for the 272 4th Avenue brownfield cleanup site. The remedial program was chosen in accordance with the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the 272 4th Avenue site and the public's input to the proposed remedy presented by the Department.

Description of Selected Remedy

The elements of the selected remedy are as follows:

1. Remedial Design

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve

energy efficiency as an element of construction.

2. Excavation

Excavation and off-site disposal of contaminant source areas, including

- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- soils which exceed the protection of groundwater soil cleanup objectives (PGWSCOs), as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above standards; and
- soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

Track 4 area: All soils in the upper two feet which exceed restricted residential SCOs will be excavated and transported off-site for disposal. Approximately 400 cubic yards of contaminated soil will be removed from this area of the site.

Track 2 area: Excavation and off-site disposal of all on-site soils which exceed restricted-residential SCOs, as defined by 6 NYCRR Part 375-6.8, in the upper 15 feet. If a Track 2 restricted residential cleanup is achieved, a Cover System will not be a required element of the remedy for this portion of the site. Approximately 3,900 cubic yards of contaminated soil will be removed from this area of the site.

Approximately 4,300 cubic yards of contaminated soil will be removed from the site in total. Collection and analysis of confirmation and documentation samples at the remedial excavation depths will be used to verify that SCOs for the site have been achieved. If confirmation/documentation sampling indicates that SCOs were not achieved at the stated remedial depth, the Applicant must notify DEC, submit the sample results and, and in consultation with DEC, determine if further remedial excavation is necessary. Further excavation for development will proceed after confirmation samples demonstrate that SCOs for the site have been achieved.

To ensure proper handling and disposal of excavated material, waste characterization sampling will be completed for all identified contaminated site material. Waste characterization sampling will be performed exclusively for the purposes of off-site disposal in a manner suitable to receiving facilities and in conformance with applicable federal, state and local laws, rules, and regulations and facility-specific permits.

3. Backfill

On-site soil which does not exceed the above excavation criteria or the protection of groundwater SCOs for any constituent may be used to backfill the excavation or re-grade the site.

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the designed grades at the site.

4. Cover System

A site cover will be required to allow for restricted residential use of the site in the Track 4 area of the site where the upper two feet of exposed surface soil will exceed the applicable soil cleanup

objectives (SCOs). Where a soil cover is to be used it will be a minimum of two feet of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to: pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

5. Groundwater Dewatering & Treatment

The proposed maximum depth of excavation in the source area is 17 feet below grade, which is below the static water table (approximately 12-15 feet below grade); therefore, dewatering to facilitate the remedial excavation is anticipated. Extracted groundwater will either be containerized for off-site licensed or permitted disposal consistent with applicable local, State, and Federal rules and regulations, or will be treated and discharged to the local sewer system in compliance with all municipal requirements and permits from NYCDEP, including pre-treatment if warranted.

6. In-Situ Chemical Oxidation

In-situ chemical oxidation (ISCO) will be implemented to treat contaminants in groundwater. Oxygen Release Compounds (ORC) will be mixed with gravel backfill below the water table to destroy the contaminants in the southeastern portion of the site where petroleum-related compounds were elevated in the groundwater. The method and depth of injection will be determined during the remedial design.

Monitoring will be required up-gradient, down-gradient and within the treatment zone. Monitoring will be conducted for petroleum-related VOCs upgradient and downgradient of the treatment zone. The treatment zone will also be monitored for dissolved oxygen and oxidation/reduction potential.

7. Vapor Mitigation

Any on-site buildings will be required to have a sub-slab depressurization system (SSDS), or other acceptable measures, to mitigate the migration of vapors into the building from soil and groundwater.

8. Institutional Control

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allow the use and development of the controlled property for restricted residential use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or NYCDOH; and
- require compliance with the Department approved Site Management Plan.

9. Site Management Plan

A Site Management Plan is required, which includes the following:

a) an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:
    - Institutional Controls: An Environmental Easement discussed in paragraph 8.
    - Engineering controls: the Cover System and SSDS discussed in paragraphs 4 and 7.

This plan includes, but may not be limited to:
an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;

- descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
- maintaining site access controls and Department notification; and
- a schedule of monitoring and frequency of submittals to the Department

b) a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
    - monitoring of groundwater to assess the performance and effectiveness of the remedy;
    - a schedule of monitoring and frequency of submittals to the Department; and
    - monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

c) an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, inspection, and reporting of any mechanical or physical components of the SSDS. The plan includes, but is not limited to:
    - procedures for operating and maintaining the system(s);
    - compliance inspection of the system(s) to ensure proper O&M as well as providing the data for any necessary reporting;
    - maintaining site access controls and Department notification; and
    - providing the Department access to the site and O&M records.

Declaration

The remedy conforms with promulgated standards and criteria that are directly applicable, or that are relevant and appropriate and takes into consideration Department guidance, as appropriate. The remedy is protective of public health and the environment.

July 20,2022

Date

Gerard Burke, Director
Remedial Bureau B

DECISION DOCUMENT

272 4th Avenue
Brooklyn, Kings County
Site No. C224298
July 2022

SECTION 1: SUMMARY AND PURPOSE

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy for the above referenced site. The disposal of contaminants at the site has resulted in threats to public health and the environment that would be addressed by the remedy. The disposal or release of contaminants at this site, as more fully described in this document, has contaminated various environmental media. Contaminants include hazardous waste and/or petroleum.

The New York State Brownfield Cleanup Program (BCP) is a voluntary program. The goal of the BCP is to enhance private-sector cleanups of brownfields and to reduce development pressure on "greenfields." A brownfield site is real property, where a contaminant is present at levels exceeding the soil cleanup objectives or other health-based or environmental standards, criteria or guidance, based on the reasonably anticipated use of the property.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and 6 NYCRR Part 375. This document is a summary of the information that can be found in the site-related reports and documents.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all remedies. A public comment period was held, during which the public was encouraged to submit comment on the proposed remedy. All comments on the remedy received during the comment period were considered by the Department in selecting a remedy for the site. Site-related reports and documents were made available for review by the public at the following document repositories:

DECInfo Locator - Web Application
https://gisservices.dec.ny.gov/gis/dil/index.html?rs=C224298

Brooklyn Public Library: Park Slope Branch
431 6th Avenue
Brooklyn, NY 11215
Phone: (718) 832-1853

Brooklyn Community Board 6

250 Baltic Street, Suite 1025
Brooklyn, NY 11201-6401
Phone: (718) 643-3027

Receive Site Citizen Participation Information By Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at http://www.dec.ny.gov/chemical/61092.html

SECTION 3: SITE DESCRIPTION AND HISTORY

Location:
The site is located at 272 4th Avenue and includes the addresses 272 4th Ave. (Lot 23), 274 4th Ave. (Lot 13), and 580 Carroll St. (Lot 17). The site is located in the Gowanus section of Brooklyn, NY. The site is abutted to the northeast by Carroll St. followed by a cafe; to the northwest by an auto repair shop followed by a community garden; to the southeast by 4th Ave. followed by apartment buildings and a furniture store; and to the southwest by a bar/cafe, followed by a New York City Transit (NYCT) system substation.

Site Features:
The site consists of three tax lots totaling approximately 0.33 acres. The site contained three commercial buildings across three lots that were demolished and the site is currently vacant. The site is currently fenced to prevent public access.

Current Zoning and Land Use:
The site was formerly zoned M1-2 (manufacturing); however, it was rezoned as part of the City-led Gowanus Rezoning and is currently zoned C4-4D (commercial) with an R9A (residential) equivalent.

Past Use of the Site:
Historical records indicate that the site had numerous historical automotive uses, with some commercial and residential uses. The site was apparent marshland with a single dwelling and a stable with attached sheds in 1888. The apparent marshland was filled in some time before 1906, when the site was partially developed as a bottle facility with a "bottle dealer" building, a shed, a stable, a washhouse, and bottle racks. By 1926, the bottle facility had been demolished and the site contained a two-story garage with two gasoline tanks (Lot 23), a single-story structure used by a wheelwright (Lot 13), and a stone yard with a single-story shed (Lot 17). By 1951, the first floor of the garage was converted into an auto repair shop with a filling station and gasoline tanks, while the second floor remained a garage (Lot 23) and the remainder of the site was depicted as an automobile garage (Lot 13) and a metal and wood finishing facility (Lot 17). In 1965, the site was depicted as an auto sales and service shop with a garage (Lot 23), part of a machine shop (Lot 13),

and an automobile repair facility (Lot 17). Between 1982 and the present, the site remained an automobile service and repair facility (Lot 23), an office (Lot 13), and an unspecified manufacturing facility (Lot 17).

Site Geology and Hydrology:
The elevation of the site is between 19.08 and 19.72 feet above the North American Vertical Datum of 1988 (NAVD88), which is an approximation of mean sea level. The site surface topography is relatively level, and the regional surface topography generally slopes west-southwest towards the Gowanus Canal and Gowanus Bay.

The stratigraphy of the Site, from the surface down, generally consists of historic fill material comprising brown sand, silt, and gravel with trace amounts of brick, glass, porcelain fragments, and concrete from surface grade to depths ranging between approximately 12 and 15 feet below sidewalk grade, underlain by presumed native gray and brown sand and gravel with some silt up to 20 feet below grade surface (bgs) (the terminus of the deepest soil boring).

Groundwater beneath the site ranges from elevation 3.46 feet to 6.33 feet NAVD88 (between approximately 12.75 and 15.33 feet bgs). Based on topography, regional groundwater is anticipated to flow in westerly toward the Gowanus Canal. However, groundwater beneath the site appears to flow in a south-southwesterly direction, which may be due to and/or affected by dewatering within the southwest-adjacent NYCT system substation and the east-adjacent NYCT subway lines below 4th Avenue for the D, N and R trains.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives (or an alternative) that restrict(s) the use of the site to restricted-residential use (which allows for commercial use and industrial use) as described in Part 375-1.8(g) were/was evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the Remedial Investigation (RI) to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is available in the RI Report.

SECTION 5: ENFORCEMENT STATUS

The Applicants under the Brownfield Cleanup Agreement are Volunteers. The Applicants do not have an obligation to address off-site contamination. However, the Department has determined that this site does not pose a significant threat to public health or the environment; accordingly, no enforcement actions are necessary.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A remedial investigation (RI) serves as the mechanism for collecting data to:

- characterize site conditions;
- determine the nature of the contamination; and
- assess risk to human health and the environment.

The RI is intended to identify the nature (or type) of contamination which may be present at a site and the extent of that contamination in the environment on the site, or leaving the site. The RI reports on data gathered to determine if the soil, groundwater, soil vapor, indoor air, surface water or sediments may have been contaminated. Monitoring wells are installed to assess groundwater and soil borings or test pits are installed to sample soil and/or waste(s) identified. If other natural resources are present, such as surface water bodies or wetlands, the water and sediment may be sampled as well. Based on the presence of contaminants in soil and groundwater, soil vapor will also be sampled for the presence of contamination. Data collected in the RI influence the development of remedial alternatives. The RI report is available for review in the site document repository and the results are summarized in section 6.3.

The analytical data collected on this site includes data for:

- groundwater
- soil
- sediment
- soil vapor
- indoor air
- sub-slab vapor

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

6.1.2: RI Results

The data have identified contaminants of concern. A "contaminant of concern" is a contaminant that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized

below. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified at this site is/are:

benzo(a)anthracene	tetrachloroethene (PCE)
benzo(a)pyrene	trichloroethene (TCE)
mercury	1,2,4-trimethylbenzene
chlorobenzene	lead
xylene (mixed)	

The contaminant(s) of concern exceed the applicable SCGs for:

- groundwater
- soil
- soil vapor intrusion

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Decision Document.

There were no IRMs performed at this site during the RI.

6.3: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water. The RI report presents a detailed discussion of any existing and potential impacts from the site to fish and wildlife receptors.

Soil and groundwater were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), per- and polyfluoroalkyl substances (PFAS), and pesticides. Soil vapor samples were analyzed for VOCs. Based on the investigations done to date, the primary contaminants of concern for the site include VOCs, SVOCs, and metals in soil, and VOCs in groundwater and soil vapor.

Soil - The highest concentrations of VOCs on-site were detected in the northern section of the site at 12-14 ft below grade. 1,2,4-trimethylbenzene was found at a maximum concentration of 5 parts per million (ppm), which exceeds the applicable protection of groundwater soil cleanup objectives (PGSCO) of 3.6 ppm. Chlorobenzene was found at a maximum concentration of 1.9 ppm (PGSCO is 1.1 ppm). The highest concentrations of SVOCs on-site were detected in the western section of the site at 0-2 ft below grade. Benzo(a)anthracene was found at a maximum concentration of 33 ppm, which exceeds the applicable restricted residential soil cleanup objective (RRSCO) of 1 ppm and PGSCO of 1ppm. Benzo(a)pyrene was found at a maximum concentration of 30 ppm, which exceeds the applicable RRSCO of 1 ppm and PGSCO of 22 ppm. Lead was detected in multiple locations throughout the site and at a maximum concentration of 6,100 ppm (RRSCO is 400 ppm).

Mercury was detected at a maximum concentration of 24.1 ppm (RRSCO is 0.81 ppm). For the emerging contaminants, neither PFOA nor PFOS exceeded the protection of groundwater guidance value.

Data does not indicate any off-site impacts in soil related to this site.

Sediment – A total of five sediment samples were collected from on-site drains located within the former on-site buildings. Contaminants detected were mainly metals, including lead at 1640 ppm which exceeds RRSCOs of 400ppm. Mercury was detected at 0.312 ppm (RRSCO is 0.81 ppm).

Data does not indicate any off-site impacts in sediment related to the site.

Groundwater - The highest concentrations of VOCs on-site were detected in the southern portion of the site at concentrations exceeding Ambient Water Quality Standards (AWQS) including chlorobenzene at a maximum concentration of 580 parts per billion (ppb) compared to the AWQS of 5 ppb, 1,2,4-trimethylbenzene at a maximum concentration of 160 ppb (AWQS is 5 ppb), and xylene was found at a maximum concentration of 580 ppb (AWQS is 5 ppb). The highest concentrations of SVOCs were detected in the northwestern portion of the site including benzo(a)anthracene at a maximum concentration of 1.6 ppb (AWQS of 0.002 ppb), and benzo(a)pyrene at a maximum concentration of 1.8 ppb (AWQS of non-detect). PFOS was detected at a maximum concentration of 29.1 parts per trillion (ppt) and PFOA was detected at a maximum concentration of 104 ppt compared with the maximum contaminant level (drinking water standard) of 10 ppt each.

Data does not indicate any offsite impacts in groundwater related to this site.

Sub-slab Soil Vapor and Indoor Air - Sub-slab soil vapor and concurrent indoor air samples were evaluated using New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion in the State of New York. Trichloroethene (TCE) was detected at the central region of the site at 109 micrograms per cubic meter (ug/m3) in sub-slab soil vapor and 0.29 ug/m3 in indoor air. Tetrachloroethene (PCE) was detected at 1270 ug/m3 in sub-slab soil vapor and 0.515 ug/m3 in indoor air.

Data does not indicate any offsite impacts in soil-vapor related to this site.

6.4: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure.*

The site is completely fenced however contact with site related soil and groundwater contamination could occur if someone digs below the surface. Contaminated groundwater at the site is not used for drinking or other purposes and the site is served by a public water supply that obtains water from a different source not affected by this contamination. Volatile organic compounds in soil vapor (air spaces within the soil) may move into buildings and affect the indoor

air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. Because there is no site building, the inhalation of site-related contaminants due to soil vapor intrusion does not represent a current concern. However, the potential exists for the inhalation of site contaminants due to soil vapor intrusion for any future on-site development. In addition, environmental sampling indicates soil vapor intrusion is not a concern for off-site buildings.

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

SECTION 7: ELEMENTS OF THE SELECTED REMEDY

The alternatives developed for the site and the evaluation of the remedial criteria are presented in the Alternative Analysis. The remedy is selected pursuant to the remedy selection criteria set forth in DER-10, Technical Guidance for Site Investigation and Remediation and 6 NYCRR Part 375.

The selected remedy is a Multiple Cleanup Tracks remedy.

The selected remedy is referred to as the Excavation, ISCO, Cover, and SSDS remedy.

The elements of the selected remedy, as shown in Figure 2 through 6, are as follows:

1. Remedial Design

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction.

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- soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

Track 4 area: All soils in the upper two feet which exceed restricted residential SCOs will be excavated and transported off-site for disposal. Approximately 400 cubic yards of contaminated soil will be removed from this area of the site.

Track 2 area: Excavation and off-site disposal of all on-site soils which exceed restricted-residential SCOs, as defined by 6 NYCRR Part 375-6.8, in the upper 15 feet. If a Track 2 restricted residential cleanup is achieved, a Cover System will not be a required element of the remedy for this portion of the site. Approximately 3,900 cubic yards of contaminated soil will be removed

from this area of the site.

Approximately 4,300 cubic yards of contaminated soil will be removed from the site in total. Collection and analysis of confirmation and documentation samples at the remedial excavation depths will be used to verify that SCOs for the site have been achieved. If confirmation/documentation sampling indicates that SCOs were not achieved at the stated remedial depth, the Applicant must notify DEC, submit the sample results and, and in consultation with DEC, determine if further remedial excavation is necessary. Further excavation for development will proceed after confirmation samples demonstrate that SCOs for the site have been achieved.

To ensure proper handling and disposal of excavated material, waste characterization sampling will be completed for all identified contaminated site material. Waste characterization sampling will be performed exclusively for the purposes of off-site disposal in a manner suitable to receiving facilities and in conformance with applicable federal, state and local laws, rules, and regulations and facility-specific permits.

3. Backfill

On-site soil which does not exceed the above excavation criteria or the protection of groundwater SCOs for any constituent may be used to backfill the excavation or re-grade the site.

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the designed grades at the site.

4. Cover System

A site cover will be required to allow for restricted residential use of the site in the Track 4 area of the site where the upper two feet of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where a soil cover is to be used it will be a minimum of two feet of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to: pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

5. Groundwater Dewatering & Treatment

The proposed maximum depth of excavation in the source area is 17 feet below grade, which is below the static water table (approximately 12-15 feet below grade); therefore, dewatering to facilitate the remedial excavation is anticipated. Extracted groundwater will either be containerized for off-site licensed or permitted disposal consistent with applicable local, State, and Federal rules and regulations, or will be treated and discharged to the local sewer system in compliance with all municipal requirements and permits from NYCDEP, including pre-treatment if warranted.

6. In-Situ Chemical Oxidation

In-situ chemical oxidation (ISCO) will be implemented to treat contaminants in groundwater.

Oxygen Release Compounds (ORC) will be mixed with gravel backfill below the water table to destroy the contaminants in the southeastern portion of the site where petroleum-related compounds were elevated in the groundwater. The method and depth of injection will be determined during the remedial design.

Monitoring will be required up-gradient, down-gradient and within the treatment zone. Monitoring will be conducted for petroleum-related VOCs upgradient and downgradient of the treatment zone. The treatment zone will also be monitored for dissolved oxygen and oxidation/reduction potential.

7. Vapor Mitigation

Any on-site buildings will be required to have a sub-slab depressurization system (SSDS), or other acceptable measures, to mitigate the migration of vapors into the building from soil and groundwater.

8. Institutional Control

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allow the use and development of the controlled property for restricted residential use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or NYCDOH; and
- require compliance with the Department approved Site Management Plan.

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a) an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:
   - Institutional Controls: An Environmental Easement discussed in paragraph 8.
   - Engineering controls: the Cover System and SSDS discussed in paragraphs 4 and 7.

This plan includes, but may not be limited to:

an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;

- descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
- maintaining site access controls and Department notification; and
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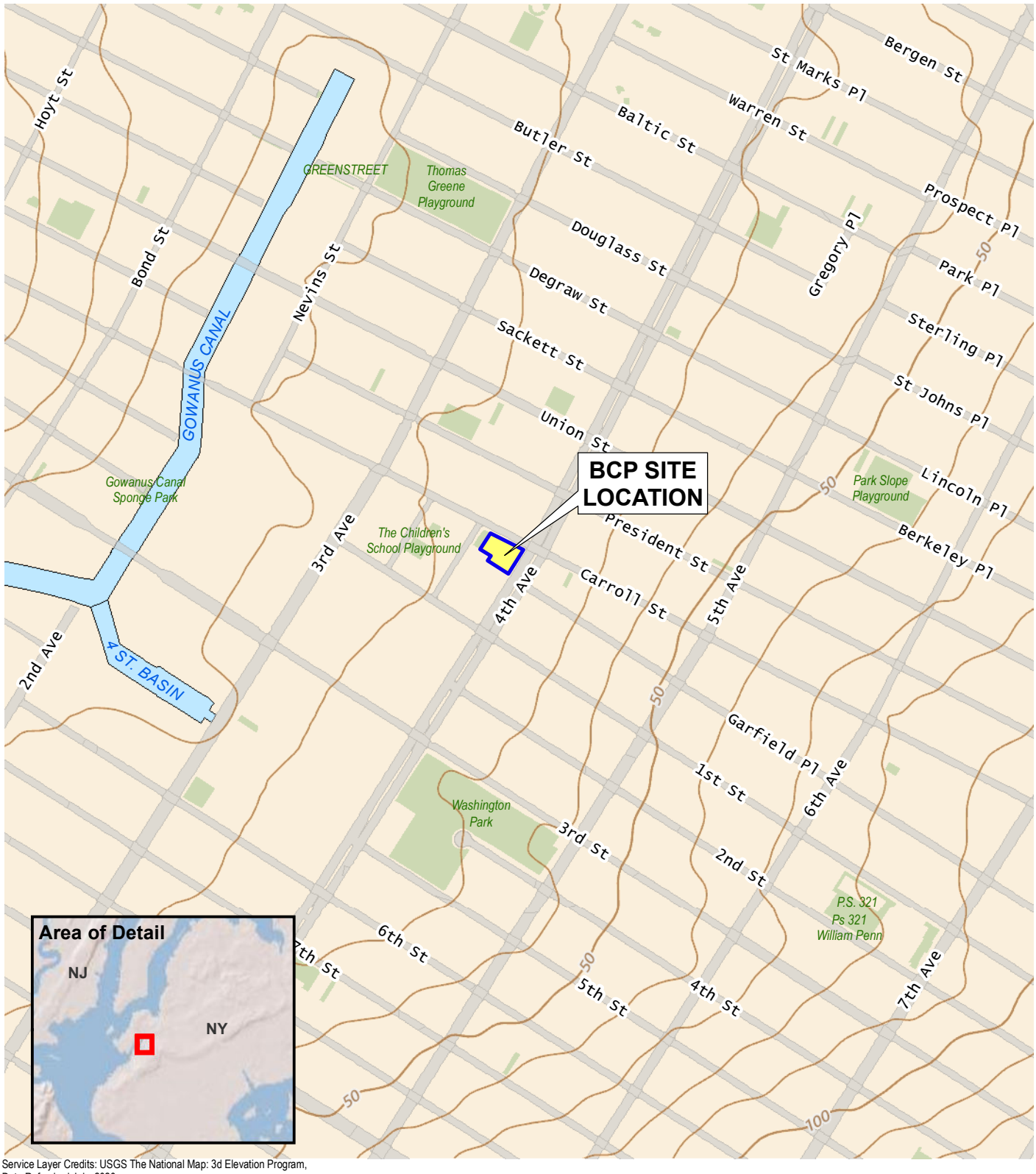
   - monitoring for vapor intrusion for any buildings on the site, as may be required by the

Institutional and Engineering Control Plan discussed above.

c) an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, inspection, and reporting of any mechanical or physical components of the SSDS. The plan includes, but is not limited to:
   - procedures for operating and maintaining the system(s);
   - compliance inspection of the system(s) to ensure proper O&M as well as providing the data for any necessary reporting;
   - maintaining site access controls and Department notification; and
   - providing the Department access to the site and O&M records.



Service Layer Credits: USGS The National Map: 3d Elevation Program, Data Refreshed July, 2020

0 600 1,200

SCALE IN FEET

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440 Park Avenue South, New York, NY 10016

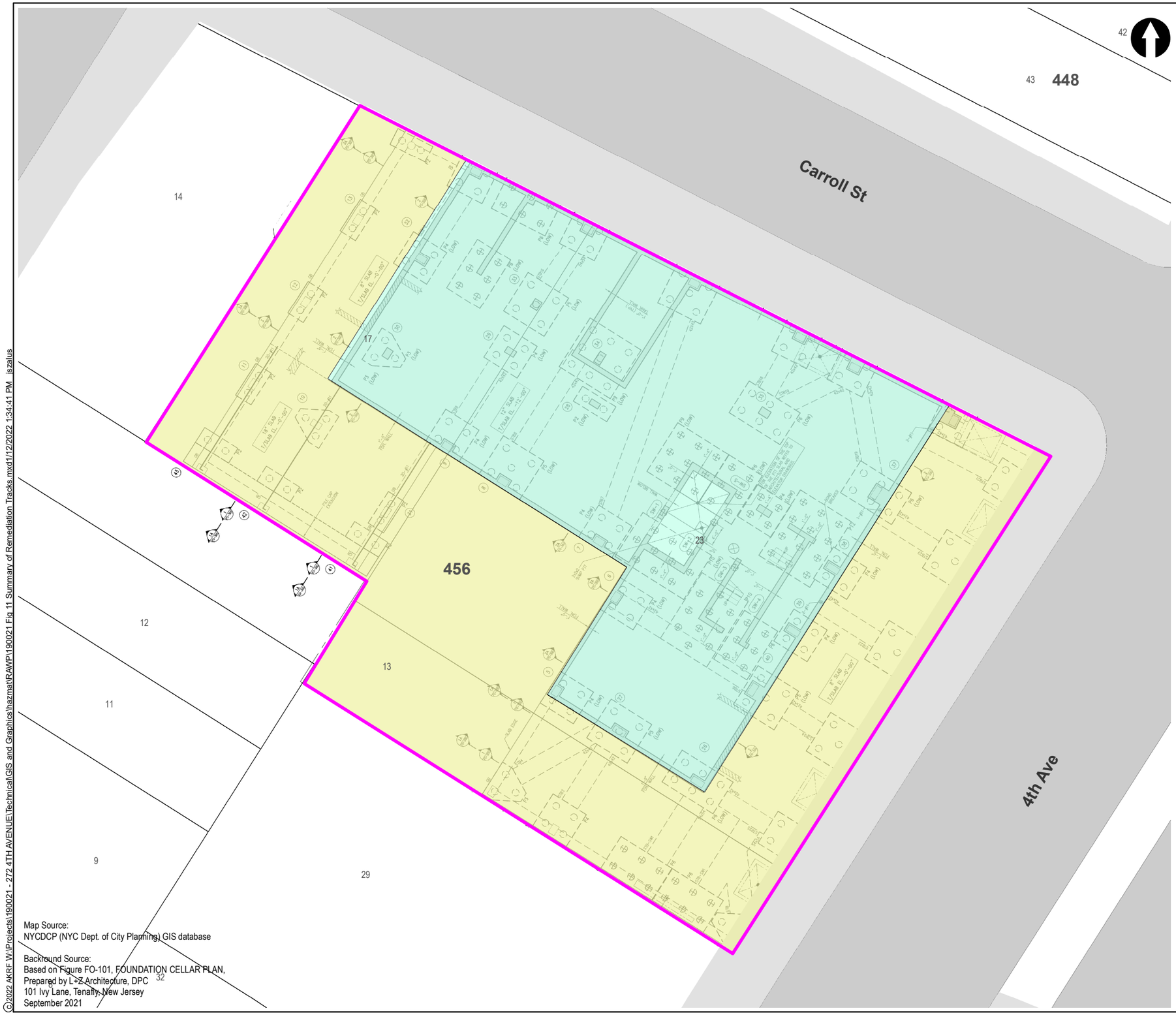
272 4th Ave
Brooklyn, New York

SITE LOCATION

DATE
9/24/2021

PROJECT NO.
190021

FIGURE
1



LEGEND

- BCP SITE BOUNDARY
- 20 LOT BOUNDARY AND TAX LOT
- 468 BLOCK NUMBER
- TRACK 2 REMEDY (EXCAVATION TO BETWEEN 13 AND 17 FEET BELOW EXISTING GRADE AND EXTENT OF CELLAR)
- TRACK 4 REMEDY (SLOPED EXCAVATION TO BETWEEN 2 AND 13 FEET BELOW EXISTING GRADE)

0 10 20 40

SCALE IN FEET

Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database

Backround Source:
Based on Figure FO-101, FOUNDATION CELLAR PLAN,
Prepared by L+Z Architecture, DPC
101 Ivy Lane, Tenafly, New Jersey
September 2021

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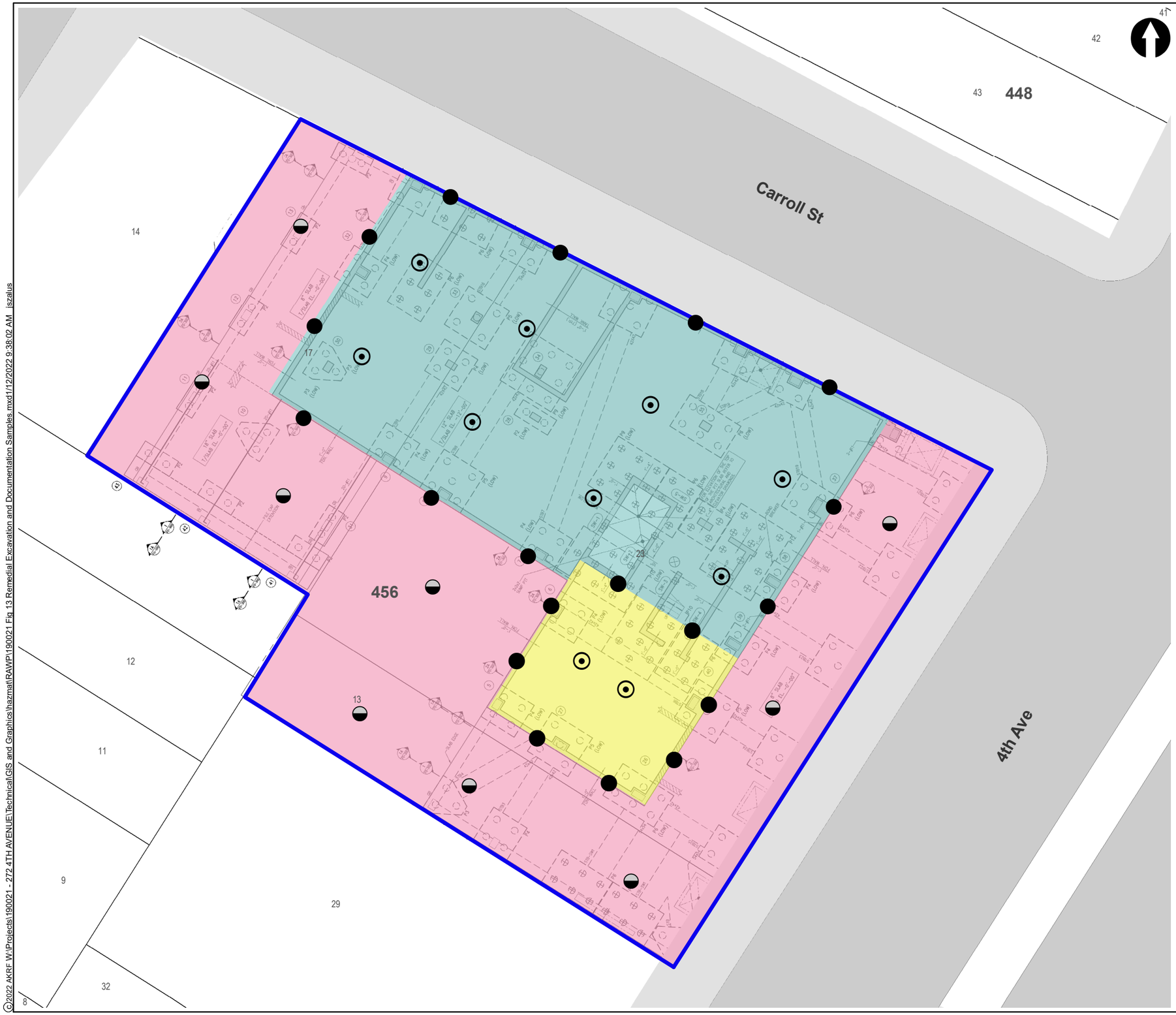
Brooklyn, New York

SUMMARY OF REMEDIATION TRACKS

DATE
1/12/2022

PROJECT NO.
190021

FIGURE
2



LEGEND

- BCP SITE BOUNDARY
- 20 — LOT BOUNDARY AND TAX LOT NUMBER
- 456 — BLOCK NUMBER
- SLOPED EXCAVATION TO BETWEEN 2 FEET ALONG THE SITE BOUNDARIES AND 13 FEET BELOW EXISTING GRADE WITH DOCUMENTATION SAMPLES AT 2 FEET (TRACK 4)
- EXCAVATION TO BETWEEN 13 AND 17 FEET BELOW EXISTING GRADE FOR PARTIAL CELLAR AND ELEVATOR PIT (TRACK 2)
- EXCAVATION TO APPROXIMATELY 15 FEET BELOW EXISTING GRADE FOR SOURCE AREA REMOVAL (TRACK 2)
- SOURCE AREA DOCUMENTATION SIDEWALL SAMPLE
- TRACK 2 DOCUMENTATION BOTTOM SAMPLE
- TRACK 4 CONFIRMATORY DOCUMENTATION BOTTOM SAMPLE LOCATION

0 10 20 40

SCALE IN FEET

Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database

Backround Source:
Based on Figure FO-101, FOUNDATION CELLAR PLAN,
Prepared by L+Z Architecture, DPC
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REMEDIAL EXCAVATION AND DOCUMENTATION SAMPLES

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DATE
1/12/2022

PROJECT NO.
190021

FIGURE
3

LEGEND

- BCP SITE BOUNDARY
- 20 — LOT BOUNDARY AND TAX LOT NUMBER
- 456 — BLOCK NUMBER
- PROPOSED MONITORING WELL
- APPROXIMATE EXTENT OF GROUNDWATER TREATMENT AREA (NYSDEC SPILL NO. 2005727)
- APPROXIMATE EXTENT OF SUB-SLAB DEPRESSURIZATION SYSTEM (SSDS) AND VAPOR BARRIER AREA
- COURTYARD AREA (NO SSDS OR CELLAR)

0 10 20 40

SCALE IN FEET

Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database

Backround Source:
Based on Figure FO-101, FOUNDATION CELLAR PLAN,
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REMEDIAL TREATMENT AREAS

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DATE
1/12/2022

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FIGURE
4

Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database

Backround Source:
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Prepared by L+Z Architecture, DPC
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COMPOSITE COVER SYSTEM PLAN

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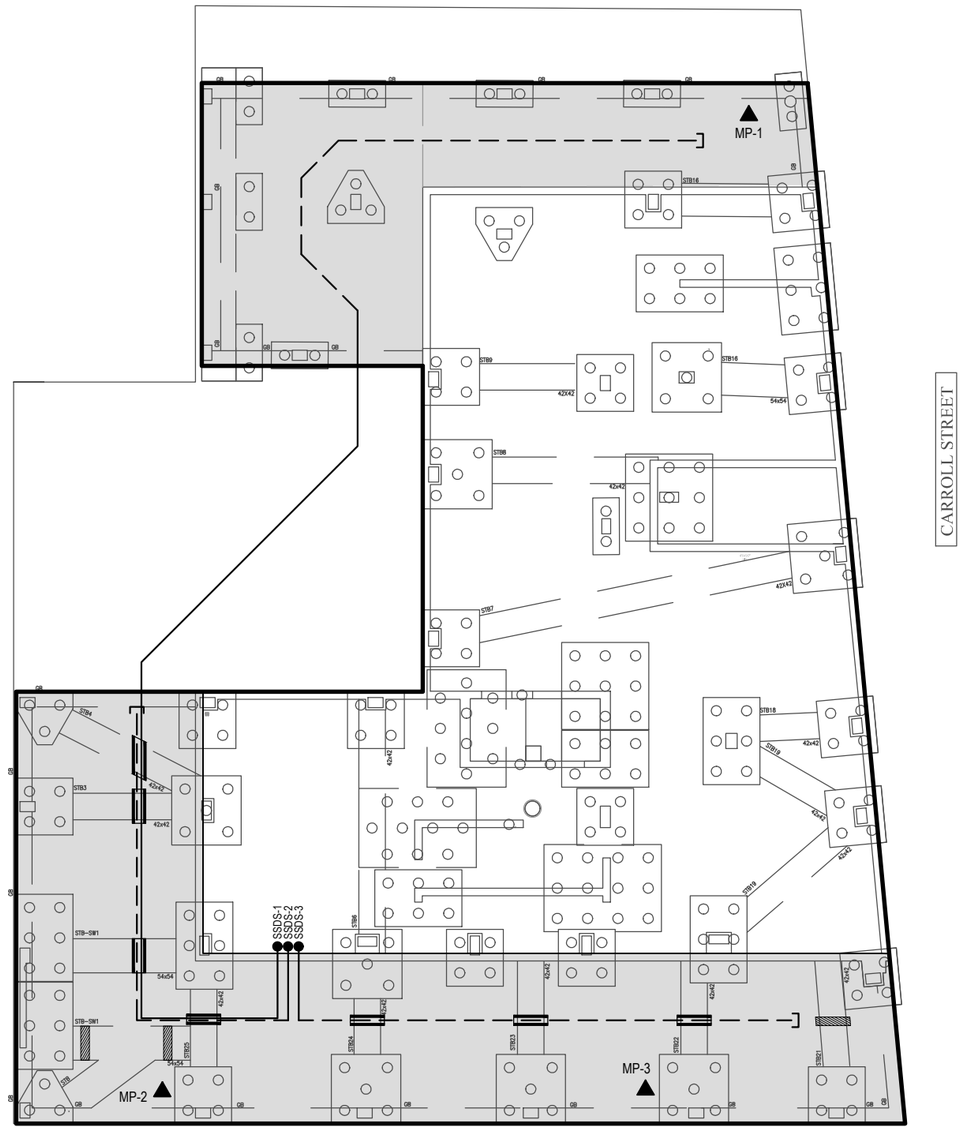
DATE
1/14/2022

PROJECT NO.
190021

FIGURE
5



LEGEND

- EXTENT OF VAPOR BARRIER
- EXTENT OF GAS PERMEABLE AGGREGATE UNDER SLAB
- PIPE SLEEVE THROUGH FOUNDATION ELEMENT
- COMMUNICATION SLEEVE THROUGH FOUNDATION ELEMENT
- 4" Ø SLOTTED SCHEDULE 40 PVC PIPE WITH PVC END CAP
- 4" Ø SOLID SCHEDULE 40 PVC PIPE
- SSDS-1 — 4" Ø INDIVIDUAL SSDS PIPE
- MP-1 — VACUUM MONITORING POINT

MONITORING POINT LOCATIONS	
ID	BUILDING ROOM NAME
MP-1	GYM, EAST OF COLUMN 31
MP-2	RETAIL, WEST OF COLUMN 25
MP-3	RETAIL, WEST OF COLUMN 22

0 10 20 40
SCALE IN FEET

NOTE: PIPE SPACING NOT TO SCALE

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CONCEPTUAL SSDS LAYOUT PLAN

DATE
1/13/2022

PROJECT NO.
190021

FIGURE
6